(19) Eur päisches Pat ntamt
European Pat nt Offic
Office européen des brevets

(11) EP 0 836 891 B1

(12) **EUROPEAN PATENT SPECIFICATION**

(45) Date of publication and mention of the grant of the patent:
18.12.2002 Bulletin 2002/51

(51) Int Cl.[7]: **B05C 11/10**, B05C 5/02

(21) Application number: **97308102.9**

(22) Date of filing: **13.10.1997**

(54) **Dispensing system**
Austragvorrichtung
Dispositif de distribution

(84) Designated Contracting States:
CH DE FR GB IT LI NL SE

(30) Priority: **16.10.1996 US 734400**

(43) Date of publication of application:
22.04.1998 Bulletin 1998/17

(73) Proprietor: **ILLINOIS TOOL WORKS INC.**
Glenview, Illinois 60025 (US)

(72) Inventor: **Bolyard, Edward W.**
Old Hickory, TN (US)

(74) Representative: **Rackham, Stephen Neil**
GILL JENNINGS & EVERY,
Broadgate House,
7 Eldon Street
London EC2M 7LH (GB)

(56) References cited:
EP-A- 0 672 462
EP-A- 0 754 628
CA-A- 2 173 774
US-A- 4 983 109
US-A- 5 368 233

EP 0 836 891 B1

Printed by Jouve, 75001 PARIS (FR)

Description

[0001] The invention relates generally to a system for dispensing fluids including hot melt adhesives supplied from a reservoir by a fluid metering device, and more particularly to a system having one or more individual fluid flow control plates interchangeably coupled to an end portion of a main manifold, wherein each individual fluid flow control plate either recirculates fluid or directs fluid toward a fluid dispensing nozzle.

[0002] The precise dispensing of hot melt adhesives and other fluids onto substrates has many applications including for example, the manufacture disposable diapers and incontinence pads, sanitary napkins, patient underlays, and surgical dressings, which require bonding one or more layers of material, or substrates. The precise control over the amount of adhesive, or fluid, dispensed is important for a number of reasons some of which are discussed in co-pending European Patent Application EP-A-0819477. It is also necessary in many applications, including those applications discussed above, to control the locations where fluid is dispensed onto the substrate, which is generally performed by configuring the fluid dispensing nozzles on the fluid dispensing system to dispense a specified pattern. Existing fluid dispensing systems, however, are not generally reconfigurable for dispensing different fluid patterns. And fluid dispensing systems that are reconfigurable require substantial disassembly and modification, which is time consuming and must be performed usually by a skilled technician.

[0003] The inventors of the present invention recognize that it is desirable conditionally to recirculate fluid as a means for dynamic fluid pressure regulation as more fully disclosed in the copending patent application above. The inventors of the present invention also recognize that it is desirable and advantageous to recirculate fluid supplied to fluid outlet ports through which fluid dispensing is not desired without utilizing dynamic fluid pressure regulation, and at the same time dynamically regulating fluid pressure related to fluid outlet ports through which fluid dispensing is desired by conditionally recirculating fluid only when the fluid pressure related to these ports increases beyond some acceptable fluid pressure level, resulting possibly from an obstructed fluid dispensing nozzle. These various features are not disclosed or known in prior art fluid dispensing systems, and particularly in systems for dispensing hot melt adhesives supplied from a reservoir by one or more fluid metering devices.

[0004] US-A-4983109 discloses a system for recirculating fluid in a fluid metering system by replacing a dispensing nozzle with a blocking plate which redirects fluid from a supply conduit to a recirculation conduit.

[0005] In view of the discussion above, there exists a demonstrated need for an advancement in the art of fluid flow control in a fluid dispensing system.

[0006] According to a first aspect of this invention a system usable for dispensing fluids, including hot melt adhesives supplied from a reservoir onto a substrate, comprises a fluid metering device having a plurality of metered fluid outlets for supplying fluid from the reservoir;

a main manifold having an end portion with a plurality of fluid outlet ports and a corresponding plurality of fluid return ports, a plurality of fluid supply conduits coupling a corresponding one of the plurality of fluid outlet ports to a corresponding metered fluid outlet of the fluid metering device, and a plurality of fluid return conduits coupling a corresponding one of the plurality of fluid return ports to the reservoir; and

at least one individual direct fluid flow nozzle adapter plate having a plate fluid inlet port on a plate fluid interface mountable to the end portion of the main manifold to couple the plate fluid inlet port to a corresponding one of the plurality of fluid outlet ports of the main manifold,

the individual direct fluid flow on a nozzle adapter plate having a plate fluid outlet port nozzle adapter interface, the plate fluid outlet port coupled to the plate fluid inlet port by a plate fluid flow conduit, the plate fluid outlet port on the nozzle adapter interface connectable to a corresponding fluid dispensing nozzle,

wherein fluid supplied to the individual direct fluid flow nozzle adapter plate by a corresponding one of the plurality of fluid supply conduits of the main manifold is directed to the plate fluid outlet port, and

wherein the plate fluid interface of the individual direct fluid flow nozzle adapter plate is coupled to the end portion of the main manifold to block a corresponding one of the plurality of fluid return ports on the end portion of the main manifold.

[0007] According to a second aspect of this invention a system usable for dispensing fluids, including hot melt adhesives supplied from a reservoir onto a substrate, comprises a fluid metering device having a plurality of metered fluid outlets for supplying fluid from the reservoir;

a main manifold having an end portion with a plurality of fluid outlet ports and a fluid return port, a plurality of fluid supply conduits coupling a corresponding one of the plurality of fluid outlet ports to a corresponding metered fluid outlet of the fluid metering device, and a fluid return conduit coupling the fluid return port to the reservoir;

a common fluid return plate having a first interface with a plurality of fluid return inlet ports coupled to a common fluid return outlet port on a second interface of the common fluid return plate, the second interface of the common fluid return plate mountable on the end portion of the main manifold to couple the common fluid return outlet port of the common fluid return plate to the fluid return port of the main manifold, and

a plurality of individual direct fluid flow nozzle adapter plates, each direct fluid flow nozzle adapter plate having a plate fluid inlet port on a first plate inter-

face mountable to the end portion of the main manifold to couple the plate fluid inlet port of the individual direct fluid flow nozzle adaptor plate to a corresponding one of the plurality of fluid outlet ports of the main manifold, and each individual direct fluid flow nozzle adapter plate having a plate fluid outlet port on a third plate interface coupled to the plate fluid inlet port by a plate fluid flow conduit;

wherein fluid supplied to the individual direct fluid flow nozzle adapter plates by a corresponding one of the plurality of fluid supply conduits of the main manifold is directed to the plate fluid outlet port on the third plate interface of the individual direct fluid flow nozzle adapter plates, and

wherein the individual direct fluid flow nozzle adapter plates have a second plate interface coupled to the first interface of the common fluid return plate to block a corresponding one of the plurality of fluid return inlet ports on the first interface of the common fluid plate.

[0008] Particular embodiments in accordance with this invention will now be described with reference to the accompanying drawings, in which:-

Figure 1 is a partial side view of a hot melt adhesive dispensing system with a main manifold and an individual fluid blocking plate coupleable to the main manifold, which manifold can be used in conjunction with the first aspect of the present invention, but which blocking plate does not belong to the present invention;

Figure 2 is a partial plan view of the main manifold of a hot melt adhesive dispensing system taken along lines I - I of Figure 1;

Figure 3a is a side view of an alternative individual fluid blocking plate coupleable with the main manifold of figures 1 and 2, which plate does not belong to the present invention;

Figure 3b is an end view taken along lines II - II of Figure 3a;

Figure 4 is a side view of an individual direct fluid flow nozzle adapter plate coupleable to a main manifold according to the first aspect of the invention;

Figure 5a is front end view of a common fluid return plate coupleable to a main manifold according to the second aspect of the invention;

Figure 5b is a side view taken along lines III - III of Figure 5a;

Figure 6a is a front end view of a plurality of alternative individual direct fluid flow adapter plates coupleable to the main manifold and to the common fluid return plate of Figure 5, in accordance with the second aspect of the invention;

Figure 6b is a side view taken along lines IV - IV of Figure 6a;

Figure 7 is a side view of another alternative individual fluid blocking plate coupleable to the main manifold and to the common fluid return plate of Figure 5, which plate does not belong to the present invention;

Figure 8 is a side view of further alternative individual fluid blocking plate coupleable to the main manifold and to the common fluid return plate of Figure 5, which plate does not belong to the present invention; and,

Figure 9 is a partial side view of a hot melt adhesive dispensing system main manifold having a recirculation manifold;

[0009] Figure 1 is a partial side view of a hot melt adhesive dispensing system 10 comprising generally a main manifold 100 having a plurality of fluid supply conduits 30 each interconnecting a corresponding one of a plurality fluid outlet ports 32 on a first end portion 102 of the main manifold with a corresponding one of a plurality of metered fluid outlets of a fluid metering device, which supplies fluid from a fluid reservoir as is more fully disclosed in the copending patent application above. More generally, however, the main manifold 100 includes additional end portions, not shown, having a plurality of fluid outlet ports each coupled to a corresponding one of the plurality of metered fluid outlets of the fluid metering device, wherein each end portion of the main manifold 100 has at least two fluid outlet ports 32.

[0010] According to the system of Figures 1 and 2, the main manifold 100 includes a plurality of fluid return conduits 40 coupling a corresponding one of a plurality of fluid return ports 42 disposed on the end portions of the main manifold 100 with the fluid reservoir. The fluid return ports 42 are coupled anywhere upstream of a fluid inlet of the fluid metering device as more fully disclosed in the copending patent above. The plurality of fluid return conduits 42 along the first end portion 102 of the main manifold 100 are interconnected by a transverse conduit 44 coupled to a common recirculation conduit 46, which is coupled to the fluid inlet of the fluid metering device or to the fluid reservoir. Figure 1 shows at least one individual fluid flow

[0011] control plate 200 coupled to the end portion of the main manifold 100 which can be used with a system according to the invention. The individual fluid flow control plate 500 includes generally a plate fluid interface 510 having at least a plate fluid inlet port 520 coupled by a plate fluid flow conduit 530 to a plate fluid outlet port 540. The plate fluid interface 510 of the individual fluid flow control plate 500 is mountable on or to the one of the end portions of the main manifold 100 to couple the plate fluid inlet port 520 of the individual fluid flow control plate 500 to a corresponding one of the plurality of fluid outlet ports 32 of the main manifold 100.

[0012] In the systems shown in Figures 1 and 3a the individual fluid flow control plate 500 is an individual fluid blocking plate having the plate fluid outlet port 540 disposed on the plate fluid interface 510. The plate fluid outlet port 540 is coupled to one of the plurality of fluid return ports 42 on the end portion of the main manifold 100 when the individual fluid blocking plate 500 is

mounted on the main manifold 100. According to this configuration, fluid supplied to the individual fluid blocking plate 500 by a corresponding one of the plurality of fluid supply conduits 30 of the main manifold 100 is directed to a corresponding one of the plurality of fluid return conduits 40 of the main manifold 100, wherein fluid supplied by the corresponding fluid supply conduit 30 is recirculated or returned by the corresponding fluid return conduit 40 to the reservoir, which in this specification means anywhere upstream of the fluid metering device inlet.

[0013] Figure 1 also shows an air flow inlet port 550, which may be coupled to an air outlet port of an air preheater module, not shown but more fully disclosed in the copending patent application above, coupleable to an air interface 560 of the individual fluid flow control plate 500. The air flow inlet port 550 of the individual fluid flow control plate 500 vents air supplied from one of several air supply conduits of the air preheater module to prevent imbalance of air pressure in other air supply conduits of the air preheater module.

[0014] A sealing member is generally disposed between the individual fluid flow control plate 500 and the end portion of the main manifold 100 to contain fluid flow and seal any unused ports. The exemplary embodiment of Figure 3b is an end view of the individual fluid flow control plate 500 of Figure 3a showing a seat 522 disposed about the plate fluid inlet port 520 and a seat 542 disposed about the plate fluid outlet port 540 for receiving corresponding O-rings or other suitable sealing members not shown. which contain fluid flow between the main manifold 100 and the individual fluid flow control plate 500. Additional seats 544 are disposed on the fluid interface 510 of the individual fluid flow control plate 500 for receiving corresponding sealing members for blocking or sealing air supply conduits 170 in the main manifold 100, which are useable to actuate a nozzle module valve as disclosed in the copending patent application above. Similar seats are arranged on the fluid interface 510 of the individual fluid flow control plate 500 of Figure 1. And in another embodiment, the seats 522, 542. and 544 may alternatively or cumulatively be disposed on the end portion of the main manifold 100.

[0015] The individual fluid flow control plate 500 is mounted on or coupled to the main manifold 100 by bolts or other fastening members disposable through bores 548 in the individual fluid flow control plate 500, which includes recesses 549 for countersinking bolt heads to permit mounting an air preheater manifold on the air interface 560 of the individual fluid flow control plate 500.

[0016] Figures 1 and 3a illustrate alternative plate fluid flow conduit 530 configurations between the plate fluid inlet port 520 and the plate fluid outlet port 540. The plate fluid flow conduit 530 of Figure 1 may be formed by drilling three holes in the individual fluid flow control plate 500, whereas the plate fluid flow conduit 530 of Figure 3a may be formed by drilling two holes in the individual fluid flow control plate 500.

[0017] In the exemplary embodiment of the first aspect of the invention shown in Figure 4, the individual fluid flow control plate 200 is an individual direct fluid flow nozzle adapter plate 200 having the plate fluid outlet port 240 disposed on a nozzle adapter interface 280. According to this configuration fluid supplied to the individual direct fluid flow nozzle adapter plate 200 by a corresponding one of the plurality of fluid supply conduits 30 of the main manifold 100 is directed by the fluid flow conduit 230 to the plate fluid outlet port 240 on the nozzle adapter interface 280 to provide an uninterrupted direct fluid flow to a fluid dispensing nozzle, not shown, coupled to the nozzle adapter interface 280. One type of fluid dispensing nozzle coupleable to the nozzle adapter interface 280 is, for example, an A-25 type nozzle, Part No. 057-B-1893, and nozzle adapter, Part No. 084B-1555, both available from ITW Dynatec, Hendersonville, Tennessee, USA which is useable for dispensing hot melt adhesives.

[0018] The plate fluid flow conduit 230 in the individual direct fluid flow nozzle adapter plate of Figure 4 may be formed by drilling a hole in the individual fluid flow control plate 200, which is coupled to a bored recess for receiving a portion of a particular fluid dispensing nozzle, which is not shown. The individual direct fluid flow nozzle adapter plate of Figure 4 also includes a seat 222 disposed about the plate fluid inlet port 220 for receiving sealing members, not shown, for containing fluid flow between the main manifold 100 and the individual fluid flow control plate 200 as discussed above. The seat 242 receives a sealing member for sealing the fluid return port 42 of the main manifold 100, and additional seats 244 are disposed on the fluid interface 210 of the individual direct fluid flow nozzle adapter plate 200 for receiving corresponding sealing members for blocking or sealing air supply conduits 170 on the main manifold 100. In another embodiment, the seats 222, 242, and 244 may alternatively or cumulatively be disposed on the end portion of the main manifold 100. Figure 4 may also include an air flow inlet port, which may be coupled to an air outlet port of an air preheater module as discussed above with respect to Figure 1. And the individual direct fluid flow nozzle adapter plate 200 of Figure 4 may be coupled to the main manifold 100 as discussed above with respect to Figures 1-3.

[0019] In an exemplary embodiment, at least one or more individual direct fluid flow nozzle adapter plates 200 of the type shown in Figure 4 are coupled to one or more of the end faces of the main manifold 100 to supply fluid from corresponding fluid supply conduits 30 to fluid dispensing nozzles coupled to the nozzle adapter interface 280. These one or more individual direct fluid flow nozzle adapter plates 200 may also be used in combination with one or more individual fluid blocking plates 500 of the type shown in Figures 1-3. Both types of individual fluid flow control plates 200,500 shown in Figures 1-4 are mountable on and removable from end portions of the main manifold 100, and may also be used

in combination with valve actuatable nozzle module assemblies including the types more fully disclosed in the copending parent application. These valve actuatable nozzle modules include the MR-1300TM Nozzle Module available from ITW Dynatec, Hendersonville, Tennessee USA. The MR-1300TM Nozzle Module includes seats for receiving sealing members to contain, seal and or block fluid and air flow between the individual fluid flow control plates 200,500 and the main manifold 100.

[0020] According to an alternative configuration of the main manifold 100 shown in Figure 9, a single fluid return port 45 is disposed on one or more end portions of the main manifold 100, as described in the copending patent application above, rather than the plurality of fluid return conduits 40 shown in the embodiments of Figures 1 and 2. The single fluid return port may be located centrally or offset toward one side of the end portion of the main manifold 100. The single fluid return port 15 is coupled to the fluid reservoir anywhere upstream of the fluid inlet of the fluid metering device by a corresponding recirculation conduit, or single fluid return conduit, 46.

[0021] Figures 5a and 5b show a common fluid return plate 300 having a first interface 310 with a plurality of fluid return inlet ports 320 coupled to a common fluid return outlet port 330 on a second interface 340 of the common fluid return plate 300. The second interface 340 of the common fluid return plate 300 is mountable on one of the end portions of the main manifold 100 to couple the common fluid return outlet port 330 of the common fluid return plate to the single fluid return port 45 of the main manifold 100. One or both the end portion of the main manifold 100 and the second interface 340 of the common fluid return plate 300 may include a seat 332 for receiving a sealing member for containing fluid between the main manifold 100 and the common fluid return plate 300 as discussed above.

[0022] Figures 6a and 6b show a plurality of alternative individual fluid flow control plates 400 coupleable to an end portion of the main manifold 100 and to the first interface 310 of the common fluid return plate 300 according to the second aspect of the present invention. Each individual fluid flow control plates 400 includes a plate fluid inlet port 410 coupled to a plate fluid outlet port 420 by a plate fluid flow conduit 430. The plate fluid inlet port 410 is on a first plate interface 440 mountable to or on the end portion of the main manifold 100 to couple the plate fluid inlet port 410 of the individual fluid flow control plate to a corresponding one of the plurality of fluid outlet ports 32 on the end portion of the main manifold 100. According to this configuration, an individual fluid flow control plate 400 corresponds to each of the fluid outlet ports 32 of the main manifold 100 and to a corresponding one of the plurality of fluid return inlet ports 320 of the common return fluid plate 300. Each individual fluid flow control plate 400 also includes a second plate interface 450 mountable on the first interface 310 of the common fluid return plate 300. And one or more of the end portion of the main manifold 100 and the first plate interface 440 of the individual fluid flow control plate 400 include a seat 412 for receiving a sealing member for containing fluid therebetween as discussed above.

[0023] In the exemplary embodiment of the second aspect of the present invention shown in Figures 6a and 6b, the individual fluid flow control plate 400 is an individual direct fluid flow nozzle adapter plate 400 having the plate fluid outlet port 420 disposed on a third plate interface 460, which functions as a nozzle adapter interface.

[0024] According to this configuration, fluid supplied to the individual direct fluid flow nozzle adapter plate 400 by a corresponding one of the plurality of fluid supply conduits 30 of the main manifold 100 is directed by the fluid flow conduit 430 to the plate fluid outlet port 420 on the third plate interface 460 to provide an uninterrupted direct fluid flow to a fluid dispensing nozzle, not shown, coupled to the nozzle adapter interface. One type of fluid dispensing nozzle coupleable to the third plate interface 460 of the individual direct fluid flow nozzle adapter plate 400 is, for example, an A-25 nozzle, Part No. 057-B-1893, available from ITVV Dynatec, Hendersonville, Tennessee, USA which is useable for dispensing hot melt adhesives.

[0025] In the exemplary embodiment of Figures 6a and 6b, the second plate interface 450 of the individual direct fluid flow nozzle adapter plate 400 is mountable on the first interface 310 of the common fluid return plate 300 to seal the fluid return inlet port 320 of the common fluid return plate 300. In the exemplary embodiment, the individual direct fluid flow nozzle adapter plate 400 includes a protruding member 455 disposable in the fluid return inlet port 320 of the common fluid return plate 300. The protruding member 455 includes a sealing member seat 456 for receiving an O-ring or other sealing member, not shown, which provides a seal between the second interface 450 of the individual fluid flow control plate 400 and the first interface 310 of the common fluid return plate 300 to block the fluid return inlet port 320 of the common fluid return plate 300. Similar protruding members with sealing members protruding from the third interface 460 are used for coupling with a fluid dispensing nozzle assembly mountable on the third interface 460.

[0026] The plates of Figures 7 and 8 are coupleable with a main manifold which can be used in conjunction with the second aspect of the present invention. The individual fluid flow control plate is an individual fluid blocking plate 700 having the plate fluid outlet port 420 disposed on the second plate interface 750. The plate fluid outlet port 720 is coupled to a corresponding one of the plurality of fluid return ports 320 on the first interface 310 of the common fluid return plate 300 when the second interface 750 of the individual fluid blocking plate is mounted on the first interface 310 of the common fluid return plate 300. According to this configuration, fluid supplied to the individual fluid blocking plate 700 by a corresponding one of the plurality of fluid supply con-

duits 30 of the main manifold 100 is directed to the fluid return conduit 46 of the main manifold 100 for recirculation. The protruding member 755 includes a sealing member seat 756 for receiving an O-ring or other sealing member, not shown, which provides a seal between the second interface 750 of the individual fluid flow control plate 700 and the first interface 310 of the common fluid return plate 300 to seal and contain fluid recirculated from the plate fluid outlet port 720 to the fluid return inlet port 320 of the common fluid return plate 300.

[0027] The individual fluid blocking plates 400,700 of Figures 6 and 7 also include an air flow inlet port 470, which may be coupled to an air outlet port of an air preheater module, which is not shown but is described in the copending patent application above. The air flow port of Figure 6 is useable for modifying air flow through a fluid dispensing nozzle coupleable to the third interface 460 of the individual direct fluid flow nozzle adapter plate 400. And the air flow port of Figure 7 is useable for venting air supplied from one of several air supply conduits of the air preheater module to prevent air pressure imbalance as discussed above.

[0028] The individual fluid blocking plates 400,700 in Figures 6-8 are mountable and removable from the main manifold 100 and the common fluid return manifold 300. And the individual fluid blocking plates 400,700 are retainable on the main manifold by fastening members and include seats for corresponding sealing members to provide seal therebetween as discussed above with respect to Figures 1 and 2. In application, the plurality of individual fluid flow control plates 400,700 coupled to the common fluid return plate 300 and to the main manifold 100 may be any combination of the individual direct fluid flow nozzle interface adapter plates 700 of Figures 6 and the individual fluid blocking plates 400 of Figures 7 and 8, which thereby provide maximum operational flexibility for fluid dispensing applications.

[0029] As shown in Figure 9, the fluid flow control plates and configurations discussed with respect to Figures 1-8 are useable in combination with a plurality of recirculation conduits 51 interconnectable between a corresponding one of the plurality of fluid supply conduits 30 and the fluid reservoir, wherein a valve 61 disposed between a corresponding one of the plurality of fluid supply conduits 30 and the reservoir conditionally recirculate fluid from a corresponding fluid supply conduit 30 toward the fluid reservoir as more fully disclosed in the copending parent application. The main manifold 100 includes second interface 180 with a plurality of fluid recirculation outlet ports 182. Each of the plurality of fluid supply conduits 30 is coupled to a corresponding one of the plurality of fluid recirculation ports 182 by a corresponding one of the plurality of fluid recirculation conduits 51, which is at least partially disposed in the main manifold 100.

[0030] A recirculation manifold 600 having a recirculation interface 610 with a plurality of recirculation inlet ports 620 is mountable on the second interface 180 of the main manifold 100, wherein each of the plurality of recirculation inlet ports 620 of the recirculation manifold 600 is coupled to a corresponding one of the plurality of fluid recirculation outlet ports 182 of the main manifold 100 when the recirculation interface 610 of the recirculation manifold 600 is coupled to the second interface 180 of the main manifold 100 as more fully disclosed in the copending parent application.

Claims

1. A system usable for dispensing fluids including hot melt adhesives supplied from a reservoir onto a substrate, the system comprising:

   a fluid metering device having a plurality of metered fluid outlets for supplying fluid from the reservoir;
   a main manifold (100) having an end portion with a plurality of fluid outlet ports (32) and a corresponding plurality of fluid return ports (42), a plurality of fluid supply conduits (30) coupling a corresponding one of the plurality of fluid outlet ports (32) to a corresponding metered fluid outlet of the fluid metering device, and a plurality of fluid return conduits (40) coupling a corresponding one of the plurality of fluid return ports (42) to the reservoir; and
   at least one individual direct fluid flow nozzle adapter plate (200) having a plate fluid inlet port (220) on a plate fluid interface (210) mountable to the end portion of the main manifold (100) to couple the plate fluid inlet port (220) to a corresponding one of the plurality of fluid outlet ports (32) of the main manifold (100) ;
   the individual direct fluid flow nozzle adapter plate (200) having a plate fluid outlet port on a nozzle adapter interface (280), the plate fluid outlet port coupled to the plate fluid inlet port (42) by a plate fluid flow conduit (230), the plate fluid outlet port on the nozzle adapter interface connectable to a corresponding fluid dispensing nozzle,

   wherein fluid supplied to the individual direct fluid flow nozzle adapter plate (200) by a corresponding one of the plurality of fluid supply conduits (30) of the main manifold (100) is directed to the plate fluid outlet port, and

   wherein the plate fluid interface (210) of the individual direct fluid flow nozzle adapter plate is coupled to the end portion of the main manifold (100) to block a corresponding one of the plurality of fluid return ports (42) on the end portion of the main manifold (100).

2. A system according to claim 1, further comprising

at least one individual fluid blocking plate having a plate fluid inlet port (220) on a plate fluid interface (210) mountable to the end portion of the main manifold (100) to couple the plate fluid inlet port to a corresponding one of the plurality of fluid outlet ports (32) of the main manifold, the individual fluid blocking plate having a plate fluid outlet port (240) on the plate fluid interface, the plate fluid outlet port coupled to a corresponding one of the plurality of fluid return ports (42) on the end portion of the main manifold (100), wherein fluid supplied to the individual fluid blocking plate (200) by a corresponding one of the plurality of fluid supply conduits (30) of the main manifold (100) is directed to a corresponding one of the plurality of fluid return conduits (40) of the main manifold (100).

3. A system usable for dispensing fluids including hot melt adhesives supplied from a reservoir onto a substrate, the system comprising:

a fluid metering device having a plurality of metered fluid outlets for supplying fluid from the reservoir;

a main manifold (100) having an end portion with a plurality of fluid outlet ports (32) and a fluid return port (45), a plurality of fluid supply conduits (30) coupling a corresponding one of the plurality of fluid outlet ports (32) to a corresponding metered fluid outlet of the fluid metering device, and a fluid return conduit (46) coupling the fluid return port (45) to the reservoir;

a common fluid return plate (300) having a first interface (310) with a plurality of fluid return inlet ports (320) coupled to a common fluid return outlet port (330) on a second interface (340) of the common fluid return plate (300), the second interface (340) of the common fluid return plate (300) mountable on the end portion of the main manifold (100) to couple the common fluid return outlet port (330) of the common fluid return plate (300) to the fluid return port (45) of the main manifold (100), and

a plurality of individual direct fluid flow nozzle adapter plates (400), each direct fluid flow nozzle adapter plate (400) having a plate fluid inlet port (410) on a first plate interface (440) mountable to the end portion of the main manifold (100) to couple the plate fluid inlet port (410) of the individual direct fluid flow nozzle adaptor plate (400) to a corresponding one of the plurality of fluid outlet ports (32) of the main manifold (100), and each individual direct fluid flow nozzle adapter plate (400) having a plate fluid outlet port (420) on a third plate interface coupled to the plate fluid inlet port (410) by a plate fluid flow conduit (430);

wherein fluid supplied to the individual direct fluid flow nozzle adapter plates (400) by a corresponding one of the plurality of fluid supply conduits (30) of the main manifold (100) is directed to the plate fluid outlet port (420) on the third plate interface (460) of the individual direct fluid flow nozzle adapter plates (400), and

wherein the individual direct fluid flow nozzle adapter plates have a second plate interface (450) coupled to the first interface (310) of the common fluid return plate (300) to block a corresponding one of the plurality of fluid return inlet ports (320) on the first interface (310) of the common fluid plate.

4. A system according to claim 3, further comprising at least one individual fluid blocking plate having a plate fluid outlet port (420) on a second plate interface, the plate fluid outlet port (420) coupled to a corresponding one of the plurality the fluid return inlet ports (320) on the first interface (310) of the common fluid return plate (300), wherein fluid supplied to the individual fluid blocking plate (400) by a corresponding one of the plurality of fluid supply conduits (30) of the main manifold (100) is directed to the fluid return conduit of the main manifold.

5. A system according to any one of the preceding claims, further comprising a plurality of fluid recirculation conduits (51), each fluid recirculation conduit (51) interconnectable between a corresponding one of the plurality of fluid supply conduits (30) and the reservoir, and a plurality of one-way valves (61), each one-way valve (61) disposed between a corresponding fluid supply conduit and the reservoir for conditional recirculation of fluid from the corresponding fluid supply conduit toward the reservoir.

6. A system according to claim 5, further comprising a second interface (180) on the main manifold (100) having a plurality of fluid recirculation outlet ports (182),

each of the plurality of fluid supply conduits (30) coupled to a corresponding one of the plurality of fluid recirculation outlet ports (182) by a corresponding one of the plurality of fluid recirculation conduits (51) at least partially disposed in the main manifold (100), and

a recirculation manifold (600) having a recirculation interface (610) with a plurality of recirculation inlet ports (620),

each of the plurality of recirculation inlet ports (620) of the recirculation manifold coupled to a corresponding one of the plurality of fluid recirculation outlet ports (182) of the main manifold when the recirculation interface (610) of the recirculation manifold is coupled to the second interface (180) of the main manifold.

Patentansprüch

1. System zur Abgabe von Fluiden, insbesondere von Heißschmelzklebstoffen, die von einem Reservoir zugeführt werden, auf ein Substrat, wobei das System umfasst:

   eine Fluid-Dosiervorrichtung mit einer Mehrzahl von Dosierungs-Fluid-Auslässen zur Zuleitung von Fluid von dem Reservoir;

   einen Hauptverteiler (100) mit einem Endbereich mit einer Mehrzahl von Fluid-Auslassöffnungen (32) und einer entsprechenden Mehrzahl von Fluid-Rücklauföffnungen (42), mit einer Mehrzahl von Fluid-Zuleitungen (30), die jeweils eine entsprechende Fluid-Auslassöffnung (32) an einen entsprechenden Dosierungs-Fluid-Auslass der Fluid-Dosiervorrichtung koppeln, und mit einer Mehrzahl von Fluid-Rückleitungen (40), die jeweils eine entsprechende Fluid-Rücklauföffnung (42) an das Reservoir koppeln; und

   mindestens eine individuelle Direktfluidstrom-Düsenadapterplatte (200) mit einer Platten-Fluid-Einlassöffnung (220) auf einer Platten-Fluid-Grenzfläche (210), die an den Endbereich des Hauptverteilers (100) montierbar ist, um die Platten-Fluid-Einlassöffnung (220) an eine entsprechende Fluid-Auslassöffnung (32) des Hauptverteilers (100) zu koppeln,

   wobei die individuelle Direktfluidstrom-Düsenadapterplatte (200) eine Platten-Fluid-Auslassöffnung auf einer Düsenadaptergrenzfläche (280) aufweist, wobei die Platten-Fluid-Auslassöffnung an die Platten-Fluid-Einlassöffnung (220) durch eine Platten-Fluidstrom-Leitung (230) gekoppelt ist, wobei die Platten-Fluid-Auslassöffnung auf der Düsenadaptergrenzfläche mit einer entsprechenden Fluid-Abgabedüse verbindbar ist,

   wobei Fluid, das der individuellen Direktfluidstrom-Düsenadapterplatte (200) durch eine entsprechende Fluid-Zuleitung (30) des Hauptverteilers (100) zugeführt wird, zu der Platten-Fluid-Auslassöffnung gelenkt wird, und

   wobei die Platten-Fluid-Grenzfläche (210) der individuellen Direktfluidstrom-Düsenadapterplatte an den Endbereich des Hauptverteilers (100) gekoppelt ist, um eine entsprechende Fluid-Rücklauföffnung (42) an dem Endbereich des Hauptverteilers (100) zu blockieren.

2. System gemäß Anspruch 1, des Weiteren umfassend mindestens eine individuelle Fluid-Blockierungsplatte mit einer Platten-Fluid-Einlassöffnung (220) auf einer Platten-Fluid-Grenzfläche (210), die an dem Endbereich des Hauptverteilers (100) montierbar ist, um die Platten-Fluid-Einlassöffnung an eine entsprechende Fluid-Auslassöffnung (32) des Hauptverteilers zu koppeln, wobei die individuelle Fluid-Blockierungsplatte eine Platten-Fluid-Auslassöffnung (240) auf der Platten-Fluid-Grenzfläche aufweist, wobei die Plattenfluid-Auslassöffnung an eine entsprechende Fluid-Rücklauföffnung (42) an dem Endbereich des Hauptverteilers (100) gekoppelt ist, wobei Fluid, das der individuellen Fluidblokkierungsplatte (200) durch eine entsprechende Fluid-Zuleitung (30) des Hauptverteilers (100) zugeführt wird, zu einer entsprechenden Fluid-Rückleitung (40) des Hauptverteilers (100) gelenkt wird.

3. System zur Abgabe von Fluiden, insbesondere von Heißschmelzklebstoffen, die von einem Reservoir zugeführt werden, auf ein Substrat, wobei das System umfasst:

   eine Fluid-Dosiervorrichtung mit einer Mehrzahl von Dosierungs-Fluid-Auslässen zur Zuleitung von Fluid von dem Reservoir;

   einen Hauptverteiler (100) mit einem Endbereich mit einer Mehrzahl von Fluid-Auslassöffnungen (32) und einer Fluid-Rücklauföffnung (45), einer Mehrzahl von Fluid-Zuleitungen (30), die eine entsprechende Fluid-Auslassöffnung (32) an einen entsprechenden Dosierungs-Fluid-Auslass der Fluid-Dosiervorrichtung koppeln, und mit einer Fluid-Rückleitung (46), welche die Fluid-Rücklauföffnung (45) an das Reservoir koppelt;

   eine gemeinsame Fluid-Rücklaufplatte (300) mit einer ersten Grenzfläche (310) mit einer Mehrzahl von Fluid-Rücklaufeinlassöffnungen (320), die an eine gemeinsame Fluid-Rücklaufauslassöffnung (330) auf einer zweiten Grenzfläche (340) der gemeinsamen Fluid-Rücklaufplatte (300) gekoppelt ist, wobei die zweite Grenzfläche (340) der gemeinsamen Fluid-Rücklaufplatte (300) an dem Endbereich des Hauptverteilers (100) montierbar ist, um die gemeinsame Fluid-Rücklaufauslassöffnung (330) der gemeinsamen Fluid-Rücklaufplatte (300) an die Fluid-Rücklauföffnung (45) des Hauptverteilers (100) zu koppeln, und

   eine Mehrzahl von individuellen Direktfluidstrom-Düsenadapterplatten (400), wobei jede Direktfluidstrom-Düsenadapterplatte (400) eine Platten-Fluid-Einlassöffnung (410) auf einer ersten Plattengrenzfläche (440) aufweist, die an den Endbereich des Hauptverteilers (100) montierbar ist, um die Platten-Fluid-Einlassöffnung (410) der individuellen Direktfluidstrom-

Düsenadapterplatte (400) an eine entsprechende Fluid-Auslassöffnung (32) des Hauptverteilers (100) zu koppeln, und jede individuelle Direktfluidstrom-Düsenadapterplatte (400) eine Platten-Fluid-Auslassöffnung (420) auf einer dritten Plattengrenzfläche aufweist, die an die Platten-Fluid-Einlassöffnung (410) durch eine Platten-Fluidstrom-Leitung (430) gekoppelt ist;

wobei Fluid, das der individuellen Direktfluidstrom-Düsenadapterplatte (400) durch eine entsprechende Fluid-Zuleitung (30) des Hauptverteilers (100) zugeführt wird, zu der Platten-Fluid-Auslassöffnung (420) auf der dritten Plattengrenzfläche (460) der individuellen Direktfluidstrom-Düsenadapterplatten (400) gelenkt wird, und

wobei die individuellen Direktfluidstrom-Düsenadapterplatten (400) eine zweite Plattengrenzfläche (450) aufweisen, die an die erste Grenzfläche (310) der gemeinsamen Fluid-Rücklaufplatte (300) gekoppelt ist, um eine entsprechende Fluid-Rücklaufeinlassöffnung (320) auf der ersten Grenzfläche (310) der gemeinsamen Fluid-Rücklaufplatte zu blockieren.

4. System gemäß Anspruch 3, des Weiteren umfassend mindestens eine individuelle Fluid-Blockierungsplatte mit einer Platten-Fluid-Auslassöffnung (720) auf einer zweiten Platten-Fluid-Grenzfläche, wobei die Platten-Fluid-Auslassöffnung (720) an eine entsprechende Fluid-Rücklaufeinlassöffnung (320) auf der ersten Grenzfläche (310) der gemeinsamen Fluid-Rücklaufplatte (300) gekoppelt ist, wobei Fluid, das der individuellen Fluidblockierungsplatte (400) durch eine entsprechende Fluid-Zuleitung (30) des Hauptverteilers (100) zugeführt wird, zu der Fluid-Rückleitung des Hauptverteilers gelenkt wird.

5. System gemäß einem der vorangehenden Ansprüche, des Weiteren umfassend eine Mehrzahl von Fluid-Umlaufleitungen (51), wobei jede Fluid-Umlaufleitung (51) zwischen einer entsprechenden Fluid-Zuleitung (30) und dem Reservoir anschließbar ist, und eine Mehrzahl von Einwegventilen (61), wobei jedes Einwegventil (61) zwischen einer entsprechenden Fluid-Zuleitung und dem Reservoir zur bedingten Kreislaufführung von Fluid von der entsprechenden Fluid-Zuleitung zu dem Reservoir angeordnet ist.

6. System gemäß Anspruch 5, des Weiteren umfassend eine zweite Grenzfläche (180) auf dem Hauptverteiler (100) mit einer Mehrzahl von Fluid-Umlaufauslassöffnungen (182),

wobei jede Fluid-Zuleitung (30) an eine entsprechende Fluid-Umlaufauslassöffnung (182) durch eine entsprechende Fluid-Umlaufleitung (51) gekoppelt ist, die zumindest teilweise im Hauptverteiler (100) angeordnet ist, und

einen Umlaufverteiler (600) mit einer Umlaufgrenzfläche (610) mit einer Mehrzahl von Umlaufeinlassöffnungen (620),

wobei jede Umlaufeinlassöffnung (620) des Umlaufverteilers an eine entsprechende Fluid-Umlaufauslassöffnung (182) des Hauptverteilers gekoppelt ist, wenn die Umlaufgrenzfläche (610) des Umlaufverteilers an die zweite Grenzfläche (180) des Hauptverteilers gekoppelt ist.

Revendications

1. Système pouvant être utilisé pour distribuer des fluides, y compris des colles à chaud délivrées à partir d'un réservoir, sur un substrat, le système comprenant:

un doseur pour fluide, présentant plusieurs sorties dosées pour fluide, pour délivrer un fluide à partir du réservoir;
un collecteur principal (100) présentant une partie d'extrémité avec plusieurs orifices (32) de sortie pour fluide, et un nombre correspondant d'orifices (42) de retour pour fluide, plusieurs conduites (30) d'alimentation en fluide raccordant un orifice correspondant parmi les multiples orifices (32) de sortie pour fluide, à une sortie dosée correspondante pour fluide du doseur pour fluide, et plusieurs conduites (40) de retour pour fluide raccordant au réservoir un orifice correspondant parmi les multiples orifices (42) de retour pour fluide; et
au moins une plaque individuelle (200) d'adaptation pour ajutage d'écoulement direct pour fluide présentant un orifice (220) d'entrée pour fluide de la plaque sur une interface (210) pour fluide de la plaque, pouvant être montée sur la partie d'extrémité du collecteur principal (100) pour raccorder l'orifice (220) d'entrée pour fluide de la plaque à un orifice correspondant parmi les multiples orifices (32) de sortie pour fluide du collecteur principal (100) ;
la plaque individuelle (200) d'adaptation pour ajutage d'écoulement direct pour fluide présentant un orifice de sortie pour fluide de la plaque sur une interface (280) d'adaptation pour ajutage, l'orifice de sortie pour fluide de la plaque étant raccordé à l'orifice (42) d'entrée pour fluide de la plaque par une conduite (230) d'écoulement pour fluide de la plaque, l'orifice de sortie pour fluide de la plaque sur l'interface d'adaptation pour ajutage pouvant se raccorder à un ajutage correspondant de distribution pour fluide,

dans lequel le fluide fourni à la plaque individuelle (200) d'adaptation pour ajutage d'écoulement direct pour fluide par une conduite correspondante parmi les multiples conduites (30) d'alimentation en fluide du collecteur principal (100) est dirigé vers l'orifice de sortie pour fluide de la plaque, et

dans lequel l'interface (210) pour fluide de la plaque individuelle d'adaptation pour ajutage d'écoulement direct pour fluide est raccordée à la partie d'extrémité du collecteur principal (100), pour bloquer un orifice correspondant parmi les multiples orifices (42) de retour pour fluide sur la partie d'extrémité du collecteur principal (100).

2. Système selon la revendication 1, comprenant en outre au moins une plaque individuelle de blocage pour fluide présentant un orifice (220) d'entrée pour fluide de la plaque sur une interface (210) pour fluide de la plaque, pouvant être montée sur la partie d'extrémité du collecteur principal (100) pour raccorder l'orifice d'entrée pour fluide de la plaque à un orifice correspondant parmi les multiples orifices (32) de sortie pour fluide du collecteur principal, la plaque individuelle de blocage pour fluide présentant un orifice (240) de sortie pour fluide de la plaque sur l'interface pour fluide de la plaque, l'orifice de sortie pour fluide de la plaque raccordé à un orifice correspondant parmi les multiples orifices (42) de retour pour fluide sur la partie d'extrémité du collecteur principal (100), dans lequel le fluide fourni à la plaque (200) individuelle de blocage pour fluide par une conduite correspondante parmi les multiples conduites (30) d'alimentation en fluide du collecteur principal (100), est dirigé vers une conduite correspondante parmi les multiples conduites (40) de retour pour fluide du collecteur principal (100).

3. Système pouvant être utilisé pour distribuer des fluides y compris des colles à chaud fournies à partir d'un réservoir sur un substrat, le système comprenant:

un doseur de fluide présentant plusieurs sorties dosées de fluide pour fournir le fluide à partir du réservoir;
un collecteur principal (100) présentant une partie d'extrémité avec plusieurs orifices (32) de sortie pour fluide et un orifice (45) de retour pour fluide, plusieurs conduites (30) d'alimentation en fluide raccordant un orifice correspondant parmi les multiples orifices (32) de sortie pour fluide à une sortie correspondante parmi les sorties dosées pour fluide du doseur de fluide, et une conduite (46) de retour pour fluide raccordant au réservoir l'orifices (45) de retour pour fluide;
une plaque commune (300) de retour pour fluide, présentant une première interface (310) avec plusieurs orifices (320) d'entrée pour le retour du fluide, raccordée à un orifice (330) commun de sortie pour le retour du fluide sur une seconde interface (340) de la plaque commune (300) de retour pour fluide, la seconde interface (340) de la plaque commune (300)de retour pour fluide pouvant être montée sur la partie d'extrémité du collecteur principal (100) pour raccorder l'orifice (330) commun de sortie pour le retour du fluide de la plaque commune (300) de retour pour fluide à l'orifice (45) de retour pour fluide du collecteur principal (100), et
plusieurs plaques (400) d'adaptation individuelles pour ajutage d'écoulement direct pour fluide, chaque plaque (400) d'adaptation individuelle pour ajutage d'écoulement direct pour fluide présentant un orifice (410) d'entrée pour fluide de la plaque sur une première interface (440) de la plaque, pouvant être montée à la partie d'extrémité du collecteur principal (100) pour raccorder l'orifice (410) d'entrée pour fluide, de la plaque (400) d'adaptation individuelle pour ajutage d'écoulement direct pour fluide, à un orifice correspondant parmi les multiples orifices (32) de sortie pour fluide du collecteur principal (100), et chaque plaque (400) d'adaptation individuelle pour ajutage d'écoulement direct pour fluide présentant un orifice (420) de sortie pour fluide de la plaque sur une troisième interface de plaque raccordée à l'orifice (410) d'entrée pour fluide de la plaque par une conduite (430) d'écoulement pour fluide de la plaque;

dans lequel le fluide fourni aux plaques (400) d'adaptation individuelles pour ajutage d'écoulement direct pour fluide par une conduite correspondante parmi les multiples conduites (30) d'alimentation en fluide du collecteur principal (100), est dirigé vers l'orifice (420) de sortie pour fluide de la plaque sur la troisième interface (460) de plaque, des plaques (400) d'adaptation individuelles pour ajutage d'écoulement direct pour fluide, et

dans lequel les plaques d'adaptation individuelles pour ajutage d'écoulement direct pour fluide ont une seconde interface (450) de plaque raccordée à la première interface (310) de plaque commune (300) de retour pour fluide, pour bloquer un orifice correspondant parmi les multiples orifices (320) d'entrée pour le retour du fluide sur la première interface (310) de la plaque commune pour fluide.

4. Système selon la revendication 3, comprenant en outre au moins une plaque individuelle de blocage pour fluide, présentant un orifice (420) de sortie pour fluide de la plaque, sur une seconde interface

de plaque, l'orifice (420) de sortie pour fluide de la plaque étant raccordé à un orifice correspondant parmi les multiples orifices (320) d'entrée pour le retour du fluide sur la première interface (310) de la plaque commune (300) de retour pour fluide, dans lequel le fluide fourni à la plaque individuelle (400) de blocage pour fluide par une conduite correspondante parmi les multiples conduites (30) d'alimentation en fluide du collecteur principal (100) est dirigé vers la conduite de retour pour fluide du collecteur principal.

5. Système selon l'une quelconque des revendications précédentes, comprenant en outre plusieurs conduites (51) de remise en circulation pour fluide, chaque conduite (51) de remise en circulation pour fluide pouvant être interconnectée entre une conduite correspondante, parmi les multiples conduites (30) d'alimentation en fluide, et le réservoir, et plusieurs valves (61) de non-retour, chaque valve (61) de non-retour étant placée entre une conduite correspondante d'alimentation en fluide, et le réservoir pour la remise en circulation conditionnelle du fluide depuis la conduite correspondante d'alimentation en fluide vers le réservoir.

6. Système selon la revendication 5, comprenant en outre une seconde interface (180) sur le collecteur principal (100) présentant plusieurs orifices (182) de sortie pour la remise en circulation du fluide,

chacune des multiples conduites (30) d'alimentation en fluide étant raccordée à un orifice correspondant parmi les multiples orifices (182) de sortie pour la remise en circulation du fluide, par une conduite correspondante parmi les multiples conduites (51) de remise en circulation du fluide au moins partiellement placées dans le collecteur principal (100), et

un collecteur (600) de remise en circulation présentant une interface (610) de remise en circulation avec plusieurs orifices (620) d'entrée pour la remise en circulation,

chacun des multiples orifices (620) d'entrée pour la remise en circulation du collecteur de remise en circulation étant raccordé à un orifice correspondant parmi les multiples orifices (182) de sortie pour la remise en circulation du fluide du collecteur principal, lorsque l'interface (610) de remise en circulation du collecteur de remise en circulation est raccordée à la seconde interface (180) du collecteur principal.

FIG. 1

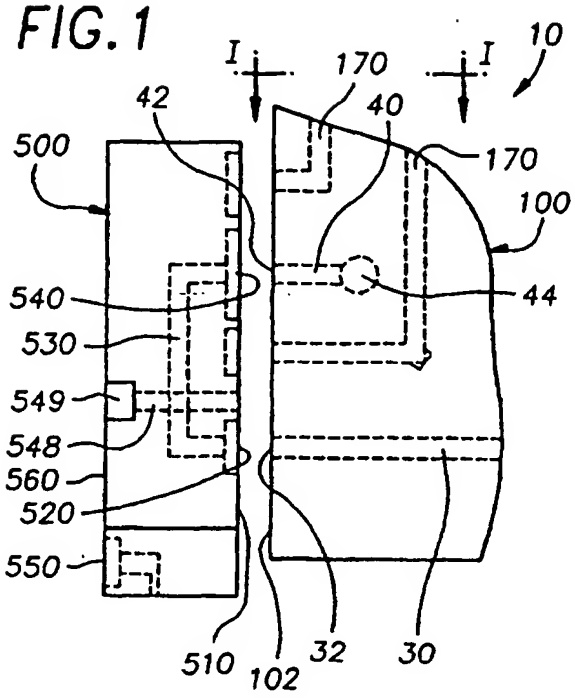


FIG. 2

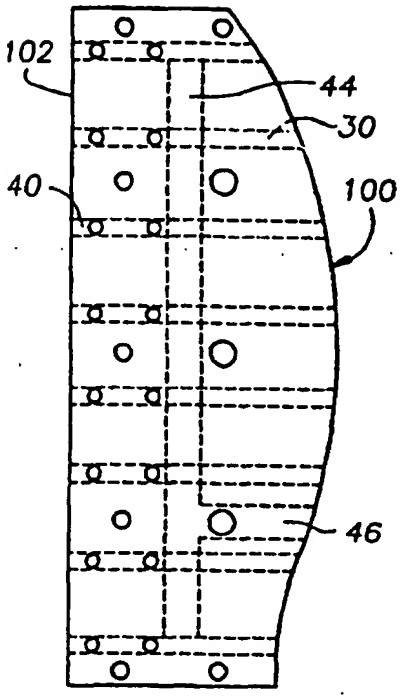


FIG. 3a

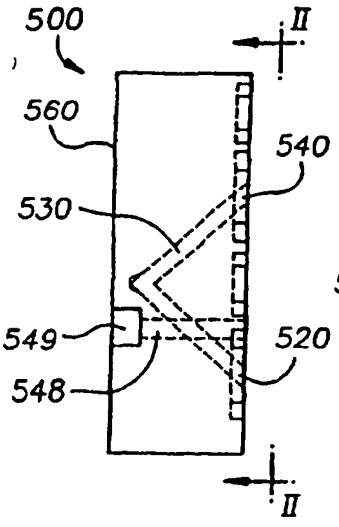


FIG. 3b

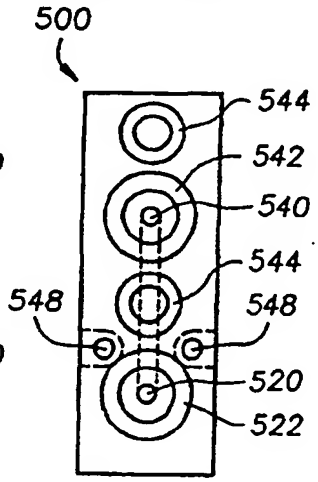
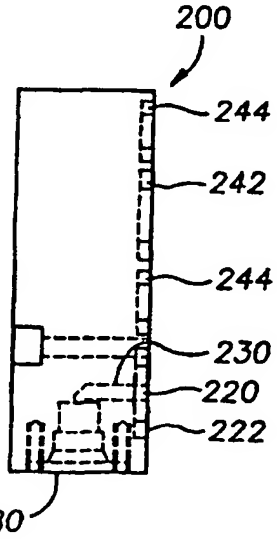


FIG. 4



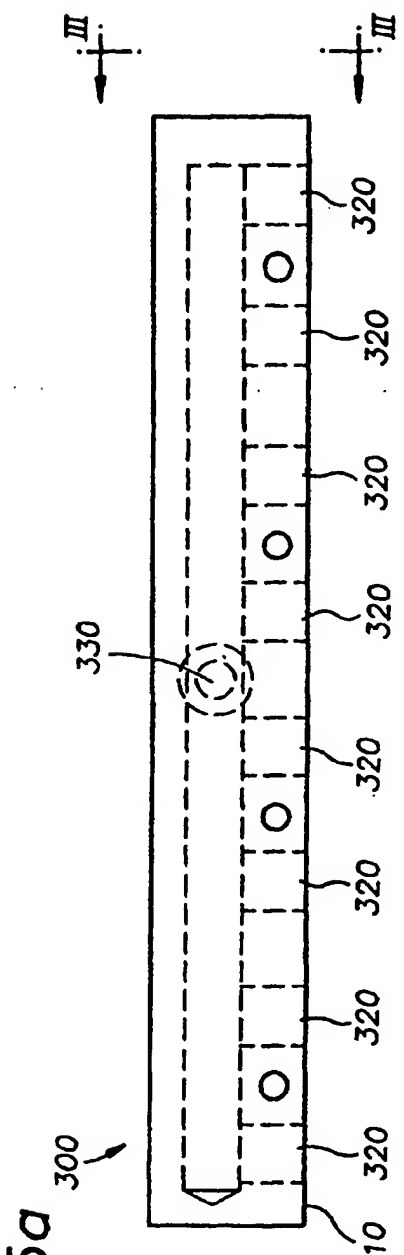

III
III
320
320
320
320
320
320
320
320
330
300
310

FIG.5a

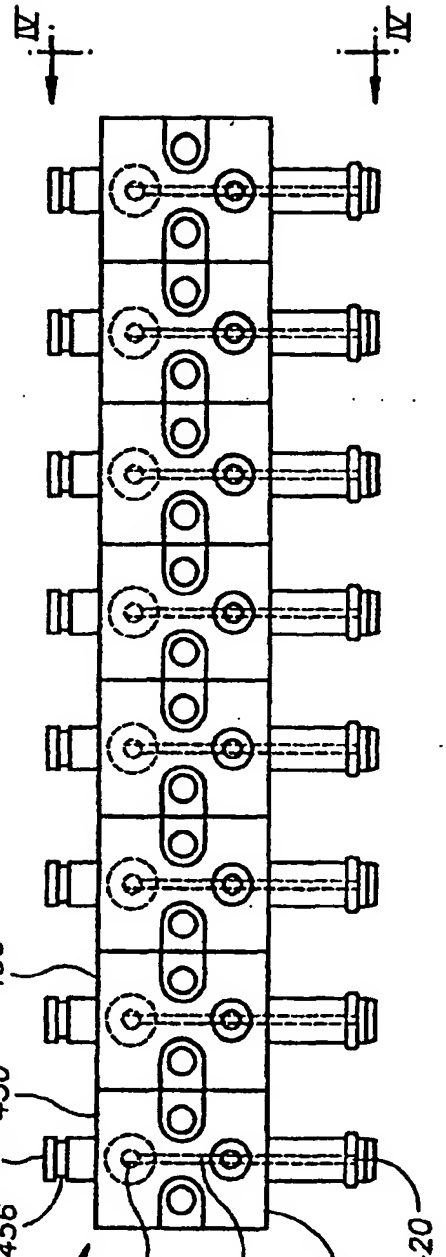

IV
IV
450
450
455
456
400
410
430
460
420

FIG.6a

FIG.5b

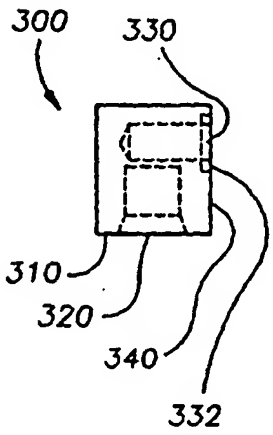


FIG.9

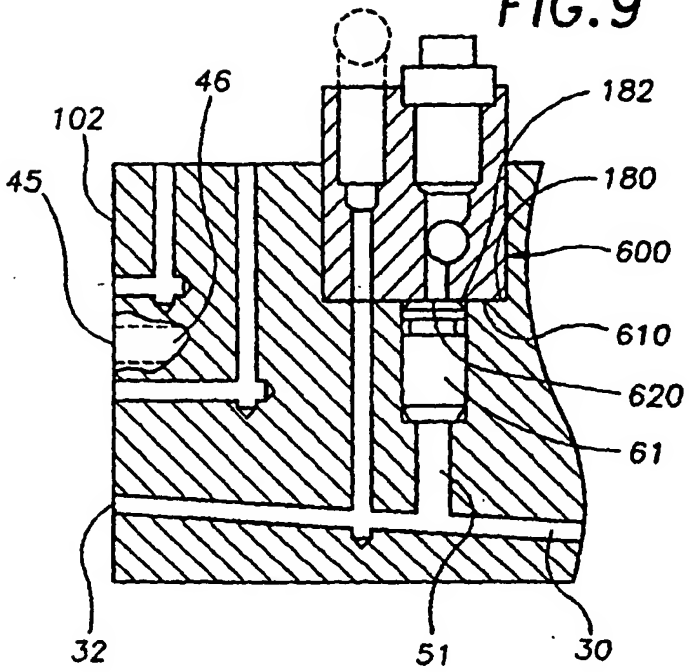


FIG.6b

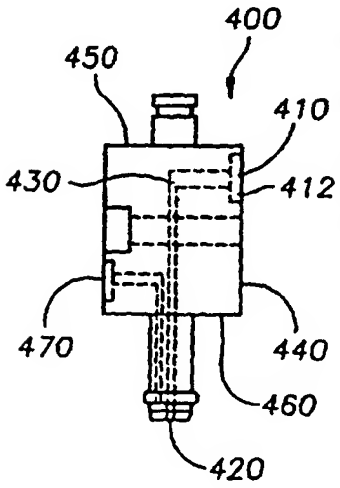


FIG.7

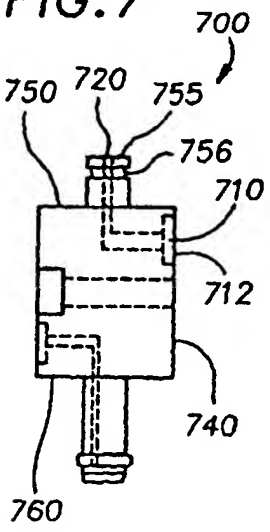


FIG.8